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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK: AF/M24T-2 TESTER, PR--ETC(U)
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Volume 116

USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

Volume 116

AF/M24T-2 Tester, Pressurized Cabin Leakage, Aircraft

DECEMBER 1976

AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The AF/M24T-2 Tester is an electric motor-driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments. This report provides measured data defining the bioacoustic environments produced by this unit operating inside a large aircraft hanger at normal rated/loaded conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band

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sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol. 1: Organization, Content and Application", AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 723104, Measurement and Prediction of Noise Environments of Air Force Operations.

The author acknowledges the efforts of Mr. L. K. Kettler of the University of Dayton and Messers Robert G. Powell and Robert A. Lee was assisted in conducting the field measurements, and Mr. John N. Cole who established the data analysis requirements and assisted in the preparation of this report. Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton assisted in the mechanics of data processing, and Mrs. Norma Peachey typed and prepared the graphics.

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INTRODUCTION

The AF/M24T-2 Tester is an electric motor-driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments.

This volume provides measured data defining the bioacoustic environments produced by this unit. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the AF/M24T-2 tester.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during *ground operations* of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure) to derive comparable data for other meteorological conditions. *Refer to Volumes 1 and 2* (references 1 and 2) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published, and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of the updated index as it is generated.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; Autovon 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application,* AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise,* AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

A standard AF/M24T-2 Tester was operated inside, and approximately in the center of a large aircraft hanger (190.5 m long × 95.1 m wide × 18.3 m high) with doors closed on a concrete floor at a normal rated condition of loaded (5 PSI). The hanger walls and ceiling were not acoustically treated. No aircraft were in the vicinity of the unit while being measured. On the other hand, no far-field acoustic data were acquired because of the relatively close proximity of the hanger walls.

Figure 1 identifies 36 noise measurement locations at a height of 1.5 meters above the concrete apron (nominal ear level of ground crew). The 0 degree reference direction passes through the tow bar. These locations are in the acoustic near-field of the source where the sound wave fronts generally do not spherically diverge and the source appears to be spatially distributed (i.e., not a point source). Consequently, these near-field data cannot be extrapolated to longer distances but do properly define the levels at locations close to the unit.

Near-field measurements were also made at ear level at the operator control panel. Table 1 lists the numeric/alphabetic designators used on the data pages in this report to identify the operator measurement location and test conditions. The designator 1/A means operator location 1 and test condition A. Such a descriptor is essential in many handbook volumes that involve multiple combinations of locations/conditions. It is used in this report to maintain format consistency.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the AF/M24T-2 unit at the 37 specified, near-field locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures in Table 3 which are widely used to assess the effects of noise on personnel and their performance.

For data at other intermediate near-field locations (i.e., for radial distances less than 4 meters) you can interpolate between the 36 measured data points.

TABLE 1

MEASUREMENT LOCATION AND TEST CONDITION
FOR OPERATOR NOISE MEASUREMENTS

AF/M24T-2 Tester, Pressurized Cabin Leakage, Aircraft
Edwards AFB, 9 Jun 1976
FSN 4920-601-6923, Mfr. Part #76150

Measurement Location	
1	Operator Control Panel
Operation	
A	Loaded (5 PSI)

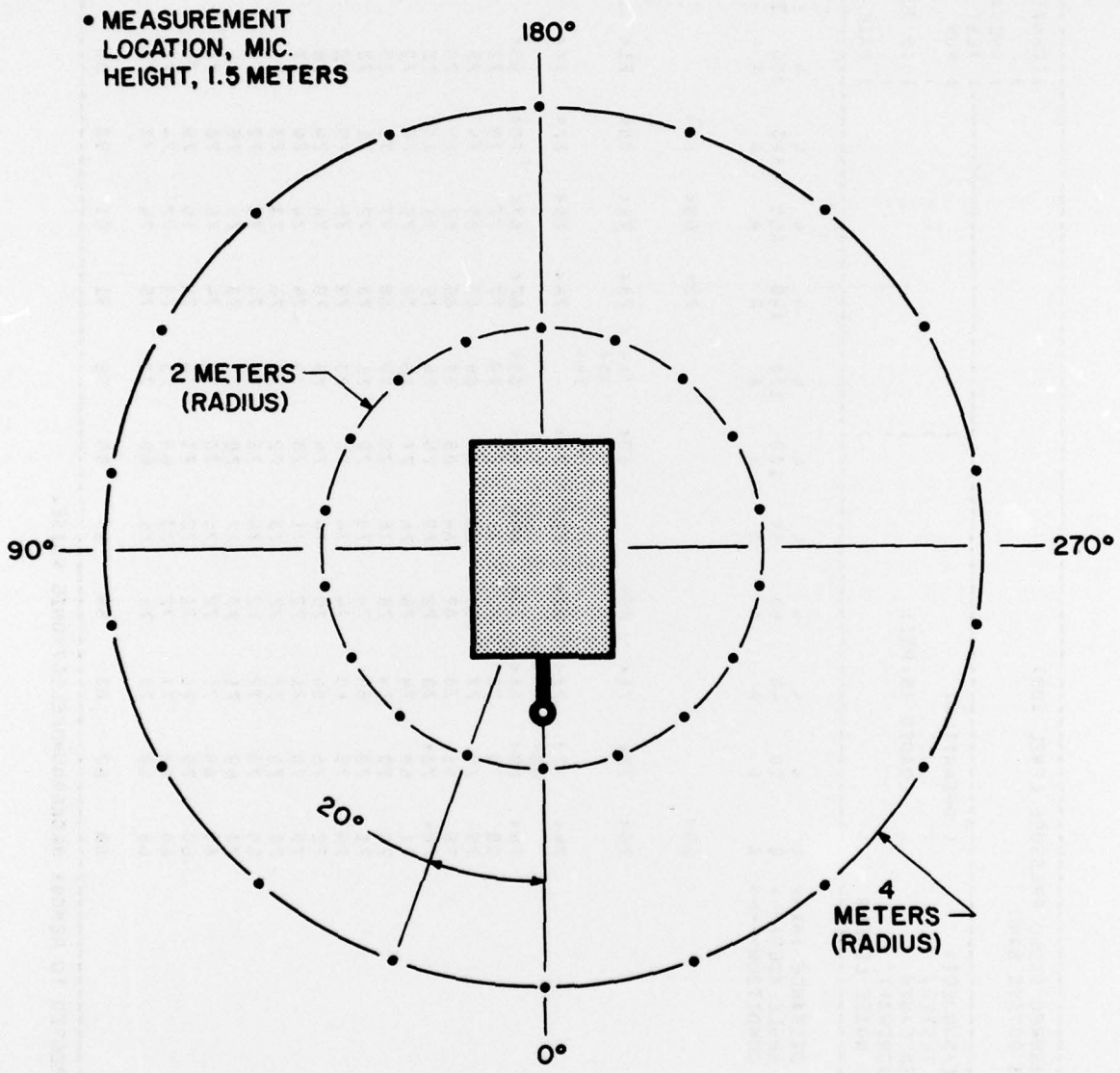

Figure 1. Measurement Locations

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 76-021-001
RUN 01
15 JUL 76
PAGE F1

NOISE SOURCE/SUBJECT:
AF/M24T-2 TESTER,
PRESSURIZED CABIN
LEAKAGE, AIRCRAFT
NEAR FIELD NOISE LEVELS

OPERATION:
LOADED (5 PSI)

FREQ (HZ)	DISTANCE (M) ->	4	4	4	4	4	4	4	4	4	4	4	4	4
	ANGLE (DEG) -->	0	20	40	60	80	100	120	140	160	180	200	220	240
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
25														
31.5		69<							72<	69<	68<			
40														
50														
63		75<	72<	71<	69<		69<	71<	78<	71<	70<	71<	74<	74<
80								80<						
100								74<						
125		74<	77<	77<	77<	76<	74<		74<	75<	77<	77<	76<	
160			68<											
200		70<	69<	68<	70<	69<	67<	68<	67<	67<	70<	69<	67<	71<
250		80	78	78	82	81	78	79	77	77	79	78	77	80
315		75	79	77	80	83	83	86	83	85	84	78	75<	83
400		76	81	78	82	84	85	87	85	87	85	79	76	84
500		70<	70<	73	72	73	74	74	75	71	68<	72	69<	70<
630		71	68	74	76	76	77	76	78	75	75	72	74	72
800		73	70	74	78	78	79	77	80	77	75	75	75	75
1000		71	70	69	74	70	70	71	73	72	71	73	73	73
1250		74	75	80	74	74	70	73	79	76	75	72	78	76
1600		72	76	80	75	74	74	75	79	78	74	78	79	81
2000		70	70	71	72	71	73	74	74	74	74	77	76	80
2500		70	70	72	72	73	72	75	74	73	73	73	77	77
3150		69	70	72	72	74	72	75	74	73	72	73	75	76
4000		70	69	71	73	72	70	73	73	75	75	76	77	77
5000		69	69	71	72	71	70	73	74	75	76	75	75	75
6300		69	70	71	71	72	71	74	74	76	75	75	75	77
8000		68	68	71	72	73	69	73	73	77	74	75	76	76
10000		66	68	70	71	71	68	73	75	74	73	73	76	74
OVERALL		86	87	88	89	90	89	92	91	91	90	88	89	91

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 76-021-001
RUN 02
15 JUL 76
PAGE F2

NOISE SOURCE/SUBJECT:
AF/M24T-2 TESTER,
PRESSURIZED CABIN
LEAKAGE, AIRCRAFT
NEAR FIELD NOISE LEVELS

OPERATION:
LOADED (5 PSI)

FREQ (HZ)	DISTANCE (M) ->	4	4	4	4	4	2	2	2	2	2	2	2	2
	ANGLE (DEG) -->	260	280	300	320	340	0	20	40	60	80	100	120	140
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
25														
31.5										69<	70<		69<	
40											75<			
50														
63		75<	75<	72<	72<	73<	75<	75<	76<	75<	75<	73<	73<	73<
80														
100								73<	72<	72<	72<			
125		78<	78<	80<	80<	79<	82<	83<	83<	82<	80<	77<	75<	77<
160						68<	72<	70<	69<	72<	73<	74<	75<	73<
200		70<	70<	71<	68<	72<	73<	73<	74<	77<	77<	76<	77	76<
250		80	79	81	79	82	80	80	84	86	85	84	84	81
315		87	88	81	86	80	81	83	84	88	85	86	91	88
400		88	89	82	88	82	81	84	85	89	86	87	92	89
500		69<	69<	70<	70<	70<	73	73	76	77	77	80	80	79
630		76	74	78	74	68	78	78	80	79	75	80	79	82
800		79	77	80	75	72	79	77	82	80	77	81	81	83
1000		73	71	73	68	75	77	74	73	75	76	75	78	79
1250		77	76	82	78	73	77	73	77	82	81	79	80	83
1600		76	83	83	79	72	78	73	77	82	82	81	80	83
2000		76	82	79	77	73	74	75	76	77	80	81	80	81
2500		77	78	79	78	74	76	75	78	80	80	80	82	83
3150		76	77	77	75	72	74	74	77	80	79	79	80	80
4000		76	76	77	75	73	74	75	78	80	80	80	82	81
5000		75	76	77	75	71	73	74	77	79	79	78	80	81
6300		76	76	76	75	72	74	74	77	79	80	79	81	82
8000		75	76	77	75	72	73	74	78	79	79	78	80	82
10000		74	75	76	75	71	72	73	77	78	78	77	80	81
OVERALL		92	94	92	92	89	90	91	93	95	94	94	97	96

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

NOISE SOURCE/SUBJECT: AF/M24T-2 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (5 PSI)

IDENTIFICATION: OMEGA 3.2 TEST 76-021-001 RUN 03 15 JUL 76 PAGE F3

FREQ (HZ)	DISTANCE (M)-> 2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION
	ANGLE (DEG)--> 160	180	200	220	240	260	280	300	320	340	TEST CONDITION
	CONDITION----> A	A	A	A	A	A	A	A	A	A	1/A
25											
31.5			68<					70<			
40			71<								
50											74<
63	72<	75<	77<	77<	77<	78<	79<	79<	77<	77<	83
80		75<	73<								
100		75<	75<							72<	72<
125	79<	80<	80<	79<	78<	76<	77<	80<	82<	82<	80<
160	71<	72<	76<	72<	70<	71<	71<	72<	72<	74<	76<
200	74<	73<	74<	71<	72<	73<	74<	73<	73<	73<	78
250	81	78	74<	72<	77	78	80	79	79	77	87
315	86	80	83	89	93	92	92	93	89	84	99
400	87	80	85	90	94	93	93	94	91	85	99
500	77	74	73	77	75	77	78	77	75	74	78
630	82	84	77	82	83	78	78	82	81	80	81
800	83	84	78	82	83	78	79	78	82	81	84
1000	78	76	77	79	78	81	77	78	81	76	85
1250	82	77	80	81	87	83	84	83	85	82	90
1600	83	76	81	81	86	83	85	83	85	82	90
2000	79	76	80	80	80	81	83	82	84	77	87
2500	80	78	80	81	84	85	84	85	85	79	89
3150	78	77	79	80	84	84	82	84	83	77	87
4000	83	81	79	81	81	82	82	84	83	78	85
5000	83	84	80	80	79	81	81	83	83	77	84
6300	85	83	80	80	80	81	82	83	82	77	84
8000	81	80	80	81	80	80	81	83	83	77	85
10000	78	77	78	80	79	79	80	82	82	76	82
OVERALL	95	93	93	95	98	98	98	98	97	93	103

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB), OCTAVE BAND

NOISE SOURCE/SUBJECT: AF/M24T-2 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (5 PSI)

IDENTIFICATION: OMEGA 3.2 TEST 76-021-001 RUN 01

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PAGE J1

FREQ (HZ)	DISTANCE (M)->	4	4	4	4	4	4	4	4	4	4	4	4	4
	ANGLE (DEG)-->	0	20	40	60	80	100	120	140	160	180	200	220	240
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
31.5														
63								81						
125			77											
250		82	82	81	84	85	84	86	84	86	85	81	79	85
500		78	81	80	83	85	85	88	86	87	85	80	79	85
1000		77	77	81	81	79	80	79	83	80	79	78	81	79
2000		75	77	81	78	77	78	79	81	80	78	81	82	84
4000		74	74	76	77	77	75	78	78	79	79	79	80	81
8000		73	73	75	76	77	74	78	78	80	79	79	81	81
OVERALL		85	87	87	89	89	89	92	90	91	90	88	88	91

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT: AF/M24T-2 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (5 PSI)

IDENTIFICATION: OMEGA 3.2 TEST 76-021-001 RUN 02 15 JUL 76 PAGE J2

FREQ (HZ)	DISTANCE (M)->	4	4	4	4	4	2	2	2	2	2	2	2	2
	ANGLE (DEG)-->	260	280	300	320	340	0	20	40	60	80	100	120	140
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
31.5											76			
63														
125						79	82	83	84	83	81	79	78	79
250		87	88	84	87	84	84	85	87	91	88	89	92	89
500		88	89	84	88	82	83	85	87	90	87	89	92	90
1000		82	80	85	80	78	82	80	84	84	83	84	84	87
2000		81	86	86	83	78	81	79	82	85	85	85	85	87
4000		80	81	82	80	77	78	79	82	84	84	84	85	85
8000		80	80	81	80	76	77	79	82	83	84	83	85	86
OVERALL		92	94	91	92	89	90	91	93	95	94	94	97	96

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT: AF/M24T-2 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (5 PSI)

IDENTIFICATION: OMEGA 3.2 TEST 76-021-001 RUN 03 15 JUL 76 PAGE J3

FREQ (HZ)	DISTANCE (M)-> 2 / ANGLE (DEG)--> 160 / CONDITION----> A	2 / 180 / A	2 / 200 / A	2 / 220 / A	2 / 240 / A	2 / 260 / A	2 / 280 / A	2 / 300 / A	2 / 320 / A	2 / 340 / A	OPERATOR LOCATION TEST CONDITION 1/A
31.5			73								
63		76	76								84
125	80	82	82	80	79	77	78	81	82	83	82
250	87	82	84	89	93	92	92	93	90	85	99
500	88	85	85	91	94	93	93	94	91	86	99
1000	86	85	83	85	88	86	86	85	87	85	91
2000	85	81	85	85	89	88	89	88	89	84	93
4000	86	86	84	85	87	87	86	89	88	82	90
8000	87	86	84	85	85	85	86	87	87	81	88
OVERALL	95	93	93	95	98	98	98	98	97	93	103

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

IDENTIFICATION:
OMEGA 3.2
TEST 76-021-001
RUN 01
15 JUL 76
PAGE H1

NOISE SOURCE/SUBJECT:
AF/M24T-2 TESTER,
PRESSURIZED CABIN
LEAKAGE, AIRCRAFT
NEAR FIELD NOISE LEVELS

OPERATION:
LOADED (5 PSI)

DISTANCE (M)->	4	4	4	4	4	4	4	4	4	4	4	4	4
ANGLE (DEG)-->	0	20	40	60	80	100	120	140	160	180	200	220	240
CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	86	87	88	89	89	89	91	90	91	90	88	88	90
OASLA	83	84	87	86	86	86	88	88	88	87	87	88	89
T	571	480	285	339	339	339	240	240	240	285	285	240	202
MINIMUM QPL EAR MUFFS													
OASLA*	61	63	63	65	66	65	68	66	67	66	63	63	66
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS													
OASLA*	57	58	58	60	61	60	63	61	62	61	58	58	61
T	960	960	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS													
OASLA*	58	60	60	62	63	63	65	64	64	63	60	61	63
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS													
OASLA*	44	44	47	47	47	47	48	49	49	47	46	47	48
T	960	960	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT													
OASLA*	55	56	59	58	58	57	59	60	59	58	58	60	61
T	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	77	79	81	80	81	81	82	83	82	81	80	81	83
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	99	100	102	102	103	102	102	104	104	103	103	104	105
C	3	3	3	3	3	3	1	3	3	3	3	3	3

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST 76-021-001
RUN 02
15 JUL 76
PAGE H2

NOISE SOURCE/SUBJECT: AF/M24T-2 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (5 PSI)

DISTANCE (M)->	4	4	4	4	4	2	2	2	2	2	2	2	2
ANGLE (DEG)-->	260	280	300	320	340	0	20	40	60	80	100	120	140
CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	92	94	91	92	88	90	90	93	95	93	94	96	95
OASLA	89	91	91	89	85	88	87	90	92	92	92	94	94
T	202	143	143	202	404	240	285	170	120	120	120	85	85
MINIMUM QPL EAR MUFFS													
OASLA*	68	70	66	68	65	66	67	69	71	69	70	73	71
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS													
OASLA*	63	64	61	63	60	61	62	64	66	64	64	68	66
T	960	960	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS													
OASLA*	66	67	64	65	61	63	63	66	68	66	67	70	69
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS													
OASLA*	49	50	50	49	46	49	48	51	52	51	51	54	54
T	960	960	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT													
OASLA*	60	62	63	61	58	60	59	62	64	64	63	65	65
T	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	83	85	85	83	79	82	81	84	86	85	86	87	88
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	105	107	107	105	102	104	103	106	107	107	108	110	110
C	3	3	3	3	3	3	2	2	2	1	3	3	3

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST 76-021-001
RUN 03
15 JUL 76
PAGE H3

NOISE SOURCE/SUBJECT: AF/M24T-2 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (5 PSI)

DISTANCE (M) ->	2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION
ANGLE (DEG) -->	160	180	200	220	240	260	280	300	320	340	TEST CONDITION
CONDITION---->	A	A	A	A	A	A	A	A	A	A	1/A
HAZARD/PROTECTION											
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR											
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR											
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)											
NO PROTECTION											
OASLC	94	92	92	95	98	97	97	98	97	92	103
OASLA	93	92	91	93	96	95	95	96	95	91	100
T	101	120	143	101	60	71	71	60	71	143	30
MINIMUM QPL EAR MUFFS											
OASLA*	70	68	68	71	74	73	73	74	72	68	79
T	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS											
OASLA*	64	62	63	66	69	68	68	69	67	63	74
T	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS											
OASLA*	67	65	65	69	72	71	71	71	70	65	77
T	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS											
OASLA*	53	52	51	53	56	55	55	55	55	51	60
T	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT											
OASLA*	64	63	63	64	67	67	67	67	68	63	72
T	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION											
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)											
PSIL	87	84	85	87	90	89	89	89	89	85	95
ANNOYANCE											
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)											
TONE CORRECTION (C IN DB)											
PNLT	110	108	106	109	112	111	111	112	112	105	114
C	3	2	1	3	3	3	3	3	3	2	2

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

*U.S.Government Printing Office: 1977 — 757-080/263